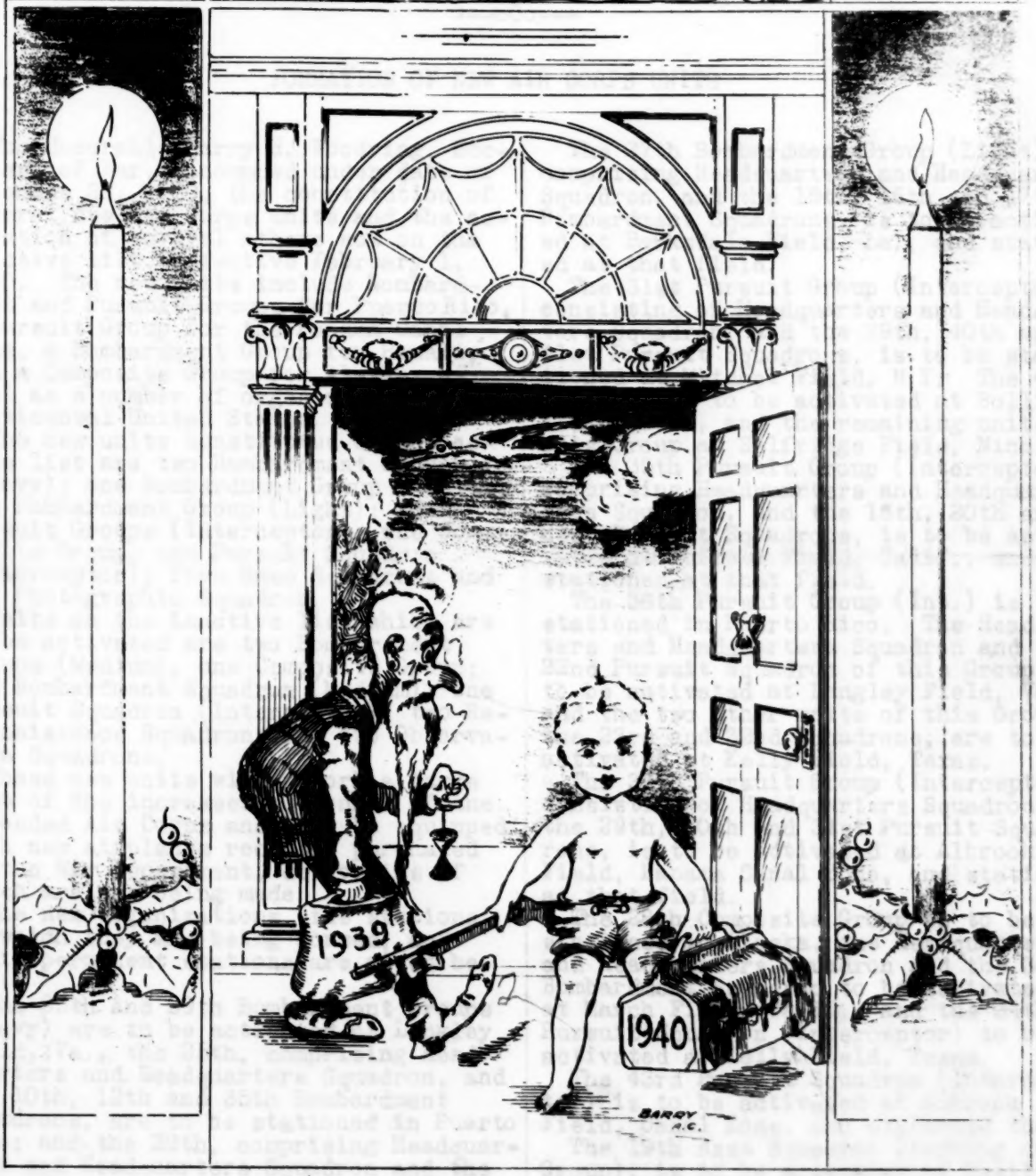
East Engin. Library
UG
633
.A43

JAN 12 1940

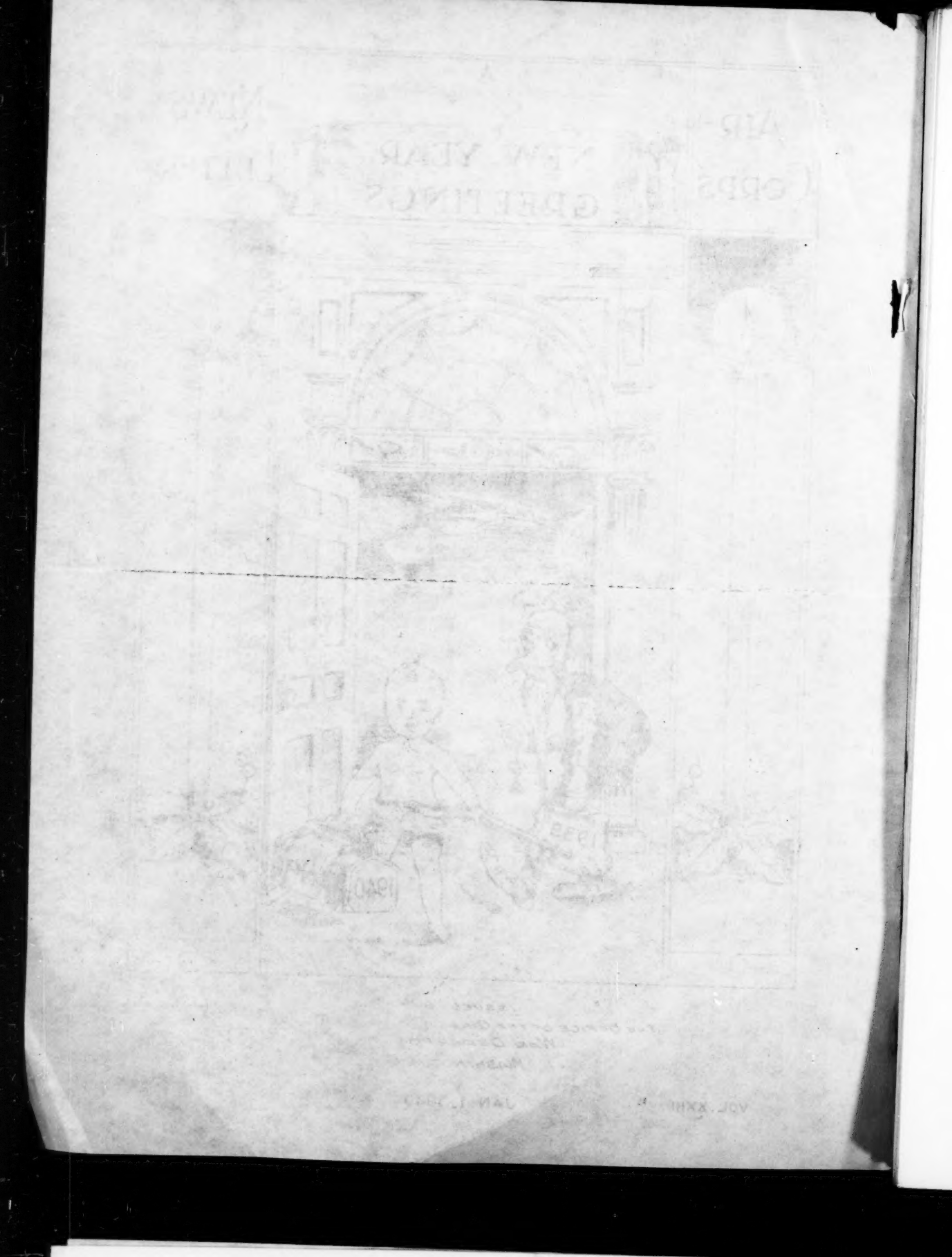
AIR CORPS NEWS LETTER

NEW YEAR GREETINGS



ISSUED BY
THE OFFICE OF THE CHIEF OF THE AIR CORPS
WAR DEPARTMENT
WASHINGTON

VOL. XXIII JAN. 1, 1940 NO. 1.



A HAPPY NEW YEAR TO ALL NEWS LETTER READERS

VOL. XXIII AIR CORPS NEWS LETTER No. 1

Information Division, Air Corps — January 1, 1940 — Munitions Building, Washington, D.C.

The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

---oOo---

FORMATION OF NEW AIR CORPS UNITS

The Honorable Harry H. Woodring, Secretary of War, announced under date of December 28, 1939, the constitution of several new Air Corps units and the activation of several others now on the inactive list, effective February 1, 1940. The new units include Bombardment and Pursuit Groups for Puerto Rico, a Pursuit Group for the Panama Canal Zone, a Bombardment Group for Hawaii, and a Composite Group for Alaska, as well as a number of organizations for continental United States.

The new units constituted on the active list are two Bombardment Groups (Heavy); one Bombardment Group (Medium); one Bombardment Group (Light); four Pursuit Groups (Interceptor); one Composite Group; one Pursuit Squadron (Interceptor); five Base Squadrons and one Photographic Squadron.

Units on the inactive list which are to be activated are two Bombardment Groups (Medium), one Composite Group; one Bombardment Squadron (Medium); one Pursuit Squadron (Interceptor); two Reconnaissance Squadrons and two Observation Squadrons.

These new units will absorb a large part of the increased personnel of the expanded Air Corps and will be equipped with new airplanes recently purchased by the War Department, deliveries of which are now being made.

The new organizations, the stations at which they are being formed, and their permanent stations are given below:

The 25th and 29th Bombardment Groups (Heavy) are to be activated at Langley Field, Va., the 25th, comprising Headquarters and Headquarters Squadron, and the 10th, 12th and 35th Bombardment Squadrons, are to be stationed in Puerto Rico; and the 29th, comprising Headquarters and Headquarters Squadron and the 6th, 29th and 52nd Bombardment Squadrons, to be stationed at the Southeast Air Base, MacDill Field, Fla.

The 22nd Bombardment Group (Medium), comprising Headquarters and Headquarters Squadron (to be activated at Mitchel Field, N.Y.), and the 19th and 33rd Bombardment Squadrons (to be activated at Patterson Field, Ohio), is to be stationed in the Panama Canal Zone.

The 27th Bombardment Group (Light), comprising Headquarters and Headquarters Squadron, and the 15th, 16th and 17th Bombardment Squadrons, is to be activated at Barksdale Field, La., and stationed at that field.

The 31st Pursuit Group (Interceptor), consisting of Headquarters and Headquarters Squadron, and the 39th, 40th and 41st Pursuit Squadrons, is to be stationed at Mitchel Field, N.Y. The 41st Squadron is to be activated at Bolling Field, D.C., and the remaining units of this Group at Selfridge Field, Mich.

The 35th Pursuit Group (Interceptor), comprising Headquarters and Headquarters Squadron, and the 18th, 20th and 21st Pursuit Squadrons, is to be activated at Moffett Field, Calif., and stationed at that field.

The 36th Pursuit Group (Int.) is to be stationed in Puerto Rico. The Headquarters and Headquarters Squadron and the 22nd Pursuit Squadron of this Group are to be activated at Langley Field, Va., and the two other units of this Group, the 23rd and 32nd Squadrons, are to be activated at Kelly Field, Texas.

The 37th Pursuit Group (Interceptor), consisting of Headquarters Squadron, the 28th, 30th and 31st Pursuit Squadrons, is to be activated at Albrook Field, Panama Canal Zone, and stationed at that field.

The 28th Composite Group is to be stationed in Alaska, the Headquarters and Headquarters Squadron and the 36th Bombardment Squadron to be activated at March Field, Calif., and the 34th Pursuit Squadron (Interceptor) to be activated at Kelly Field, Texas.

The 43rd Pursuit Squadron (Interceptor) is to be activated at Albrook Field, Canal Zone, and stationed there.

The 19th Base Squadron (serving one Group), is to be activated at Hamilton Field, Calif., and stationed at McChord Field, Wash.

The 23rd Base Squadron (serving one Group), is to be activated at March Field, Calif., and stationed in Alaska.

The 24th Base Squadron (serving two Groups), is to be activated at Kelly Field, Texas, and stationed in Puerto Rico.

The 26th Base Squadron (serving one

V-8323, A.C.

Group) is to be activated at Maxwell Field, Ala., and stationed at the Northeast Air Base (Westover Field, Mass.)

The 27th Base Squadron (serving one Group) is to be activated at Barksdale Field, La., and stationed at the Southeast Base (MacDill Field, Fla.)

The 1st Photographic Squadron is to be activated at Bolling Field, D.C., and stationed at that field.

The units on the inactive list which are to be activated are listed below, as follows:

11th Bombardment Group (Medium), comprising Headquarters and Headquarters Squadron, and the 14th and 42nd Bombardment Squadrons, is to be activated at Hickam Field, T.H., and stationed thereat.

The 22nd Bombardment Group (Medium), comprising the 2nd Bombardment Squadron, is to be activated at Bolling Field, D.C., and stationed in the Panama Canal Department.

The 28th Composite Group, comprising the 37th Bombardment Squadron (Medium) is to be activated at Barksdale Field, La., and stationed in Alaska.

The 3rd Bombardment Squadron (Medium) is to be activated at France Field, Canal Zone, and stationed at Howard Field, Canal Zone.

The 78th Pursuit Squadron (Interceptor) is to be activated and stationed at Wheeler Field, T.H.

The 41st Reconnaissance Squadron (Light Reconnaissance) is to be activated at Langley Field, Va., and stationed at MacDill Field, Fla. (Southeast Base).

The 89th Reconnaissance Squadron (Medium Reconnaissance), is to be activated at March Field, Calif., and to be stationed at McChord Field, Wash.

The 39th Observation Squadron (Corps and Division) is to be activated and stationed at France Field, Canal Zone.

The 86th Observation Squadron (Corps and Division) is to be activated and stationed at Wheeler Field, T.H.

---oOo---

THE FLYING CADET DRUM AND BUGLE CORPS

Organized at Randolph Field, Texas, on November 27, 1939, the Cadet Drum and Bugle Corps made its first appearance at the graduation retreat exercises held on December 17th. Lieut. J.R. Luper is in charge of the organization.

The Drum and Bugle Corps is composed of 15 Cadets, with Cadet J.F. Schirmer designated as leader. The Cadet Battalion feels that the organization is even more successful and valuable than anticipated at first. It has proved invaluable for ceremonies, Sunday parades, and Saturday reviews, etc., and has assisted in instilling a high morale and resulting high standard of efficiency in the Flying Cadet Battalion.

CREATION OF AN AIR DEFENSE COMMAND

The Secretary of War, the Hon. Harry H. Woodring, announced on December 20, 1939, that an important step toward the completion of comprehensive plans for the national defense will be taken in the near future by the War Department. In brief, an air defense command will be created which will include the coordinated control of antiaircraft units, squadrons of Pursuit planes, and the aircraft warning service of signal communications, all elements for the protection of an area against hostile air attack. The commander will be Brigadier General James E. Chaney, who was promoted to that rank on January 1, 1940.

At the present time, all of the mobile combat units of the Air Corps are concentrated in one organization known as the General Headquarters, or GHQ Air Force. This command is divided into three wings, located respectively on the West Coast, the East Coast and the Gulf Coast. It includes offensive and defensive types of aircraft, Bombers, Attack and Pursuit planes, and Reconnaissance Squadrons. Our ground antiaircraft defense consists of some fixed antiaircraft artillery in strategic localities, but principally of mobile antiaircraft artillery regiments, now scattered throughout the United States at Army posts.

The creation of an air defense command will provide experience and the basis for future developments of this nature, in the control of both air and antiaircraft units, Interceptor-Pursuit Groups, antiaircraft regiments and Signal Corps units. The Interceptor-Pursuit Groups will provide the highly mobile long-range weapons for the purpose of meeting and defeating any hostile air attack threatening a particular area and, in cooperation with the antiaircraft artillery units, will furnish close-in defense for vital localities, whether for cities, manufacturing areas or for armies in the field. The Signal Corps communication units will provide the necessary aircraft warning service.

To facilitate training, it is intended initially to establish the first command of this nature in the northeastern part of the United States, utilizing existing Army posts and air fields to maximum capacity. The new Northeast Air Base (Westover Field) will, upon its completion, become one of the more important elements of this organization. Meanwhile, existing air fields and posts must be utilized.

Since forces of several arms are involved, this command should be organized and developed by a specially qualified general officer charged with the

(Continued on Page 4)

LEGISLATORS VISIT AIR CORPS FIELDS

Wright Field

On Wednesday, December 13, 1939, at 11:30 a.m., Wright Field received a visit from six members of a larger Congressional group, which since early November had been on a tour of inspection of Army posts and stations in the United States and the Panama Canal Zone. The flight included stopovers in Guatemala and Mexico City. The Congressmen who came to Wright Field were:

Senator Elmer Thomas, Oklahoma;

Senator Harry H. Schwartz, Wyoming;

Representatives John J. Sparkman, 8th District of Alabama; Charles R. Clason, 2nd District of Massachusetts; Paul W. Shafer, 3rd District of Michigan, and Thomas E. Martin, 1st District of Iowa.

Senator Thomas is Chairman of the Senate Subcommittee on Appropriations for the War Department; Senator Schwartz is a member of the Senate Military Affairs Committee; and Representatives Sparkman, Clason, Shafer and Martin are members of the House Military Affairs Committee.

The party, which had been accompanied on its trip by Major Arthur R. Wilson, General Staff Corps, and Major John E. Upston, Office Chief of the Air Corps, flight commander, arrived in two C-39 Douglas airplanes, piloted by Captains C.E. Culbertson, M.C. Woodbury, Lieuts. J.J. Roberts and K.A. Cavenah.

The visit at the Materiel Division was briefer than had at first been anticipated, and it was impossible for the Congressmen to inspect all the exhibits of experimental equipment which had been prepared. They were shown all construction projects, and were so interested by the developments viewed in the laboratories that they expressed a desire to return at a later date with a greater number of Military Affairs Committee members for a more thorough inspection.

Upon landing, the party was met by Lieut. Colonel Oliver P. Echols, Technical Executive and Assistant Chief of the Materiel Division, and Lieut. Col. L. T. Miller, Administrative Executive. General Brett, Chief of the Materiel Division, found it impossible to be in Dayton at the time.

The Congressmen spent the night in Dayton and were entertained at dinner by the Dayton Chamber of Commerce. They took off early the next morning for Washington.

San Antonio Air Depot, Texas

The Congressional delegation, headed by Senator Elmer Thomas, of Oklahoma, Chairman of the Senate Subcommittee on Appropriations for the War Department, and composed of 14 members of the Military Affairs Committees of the Senate and House, paid a visit to this Depot on Saturday afternoon, November 25th, in the course of their inspection of Army posts in the United States and the Canal Zone, involving a 7,000-mile aerial tour. The legislators were particularly interested in new construction needs at the Depot. Members of the delegation, in addition to Senator Thomas, were Senators H.S. Truman, Sherman Minton, H.H. Schwartz, Chan Gurney, Representatives R.E. Thomason, D.D. Terry, J.M. Costello, Overton Brooks, J.J. Sparkman, C.R. Clason, P.W. Shafer, W.D. Byron and T.E. Martin.

The group was accompanied by Majors Wilson and Upston, Captains Culbertson and Woodbury, Lieuts. T.W. Rafferty, W.E. Davis, J.J. Roberts and K.A. Flagley, with six enlisted mechanics and radio operators.

During their stay in San Antonio, the members of the party were also accompanied by Representative Paul J. Kilday, of the 20th Texas Congressional District.

Chanute Field, Ill.

The Congressional inspection party, consisting of Senators Thomas and Schwartz, Representatives Clason, Sparkman, and Martin, arrived at Chanute Field on the morning of December 12th. The weather was threatening and, as no previous flight had been cancelled, the record was maintained by virtue of a somewhat curtailed visit.

Immediately upon landing, the visitors were met by field personnel and distinguished guests of the post from the surrounding communities. An inspection was made of the present Technical School and the new construction, after which the party motored to the Officers' Club for lunch.

During the luncheon, Colonel Davenport Johnson, commanding Chanute Field, in a brief address, welcomed the visitors and guests and voiced his appreciation over their presence. Senator Thomas, of Oklahoma, replied for the Congressional party, outlining the purpose of the visit, and concluded by congratulating the Air Corps on its splendid progress. He assured his listeners that the United States defense forces would not be the largest in the world, but the finest. Mr. Arthur C. Willard, President of the University of Illinois, spoke briefly on the University and stated that they were happy to pay their debt to the Government and, since his school maintained the largest R.O.T.C. unit in the nation, they would always cooperate to the fullest in the discharge of their obligations.

Congressmen William H. Wheat, of Rantoul, and Leslie Arends, of Melvin, Ill., met the visitors at Chanute Field and remained until their departure. Colonel Gerald C. Brant, A.C., flew to Lowry Field, Denver, Colo., met the party at that point and accompanied it

to Chanute Field via Scott Field.

All officers of Chanute Field attended the luncheon, and the following civilian guests were present, in addition to those previously mentioned: Dr. A.J. Janata and Dean M.L. Enger, of the University of Illinois; Mayor James I. Flynn, Messrs. C.E. Bowen, Hardin Boulware, W.H. Lee, Frank K. Robeson, Gordon Bilderback, J.A. McDermott and W.S. Hansen, of Champaign, Ill.; Mayor George Hurd, Messrs. Edward Lindsay and Harry Biegler, of Urbana, Ill.; Colonel S.S. Denney, Messrs. Leland Fowler, James F. Clark, Glenn Fultz, Chester Webber and W.F. Rogers, of Rantoul, Ill.

The visitors departed at 1:00 p.m., for Battle Creek, Mich. The balance of the tour will take the party to Wright and Bolling Fields; Schenectady and Albany, N.Y.; Picatinny Arsenal, and return to Bolling Field.

---oOo---

CHANUTE FIELD PERSONNEL ON AIR TOUR

First Lieut. Glenn Thompson, Air Corps, of Chanute Field, and Mr. Richard W. Faubion, Trade Test Department, Air Corps Technical School, completed a tour of Air Corps stations throughout the United States in order to institute a system of coordination at Air Corps stations authorized to conduct Alpha Test and classify enlisted men for enrollment in courses at the Air Corps Technical Schools.

Some confusion has heretofore existed in the conduct of these examinations, and the several stations have maintained varying standards in arriving at the final grades and classification of prospective students.

Lieut. Thompson and Mr. Faubion spent approximately one month on their air tour, visiting the following mentioned Air Corps fields in the order given: Selfridge, Mitchel, Bolling, Langley, Maxwell, Barksdale, Randolph, March, Moffett, Hamilton, Lowry and return to Chanute Field on December 13, 1939.

Lieut. Thompson is on duty in the Office of the Commandant, Air Corps Technical Schools.

---oOo---

ERRAND OF MERCY ENDS IN DISASTER

A mercy flying mission, attempted by two pilots of Albrook Field, Canal Zone, accompanied by two medical officers, almost ended in disaster when the Grumman Amphibian in which they were riding nosed over on a water landing and sank in about 15 feet of water.

First Lieuts. T.C. Darcy and John R. Kelly, Air Corps, were pilot and co-pilot, respectively, of the Amphibian, the medical officers being Captains L.E. Griffis, of Albrook Field, and E.F. Austin, of Quarry Heights. The engineer was Corporal J.S. Kouba, of the 74th Bombardment Squadron.

The flight departed on December 12th for the San Blas Islands, on the Atlantic coast, for the purpose of treating several cases of illnesses reported among the San Blas Indians of Tigre Island.

Officers on the flight reported that a landing was attempted in rough water, that the bow of the plane caved in and that she sank.

Cuts and bruises were suffered by several men on the flight, but no serious injuries were reported. It was necessary for the men to remain at the San Blas Islands overnight. They returned in another Amphibian the following day, same being piloted by Lieut.Col. Gilkeson, commanding the 16th Pursuit Group, and Captain R.E. Randall, Group Operations Officer.

Two Navy boats went to the scene of the crash and an attempt was made to raise the airplane from the water.

Best comment on the trip was noted in the Form 1, filled out by Lieut. Darcy. With the plane in 15 feet of water, he entered on the back of the form -- "Needs Major Overhaul."

---oOo---

Creation of an Air Defense Command

(Continued from Page 2)

training of both ground and air units and with the perfection of the coordination necessary to defend an area against air attack.

Brigadier General James E. Chaney, who prior to January 1, 1940, held the rank of Colonel and commanded Mitchel Field, N.Y., and who was selected for this important duty, is an officer of outstanding record and reputation, a graduate of the Army War College, an ex-member of the War Department General Staff, and more recently the senior staff officer who accompanied General George C. Marshall on the good will mission to Brazil of May and June, 1939.

---oOo---

CHINESE OFFICERS OBSERVE TRAINING

Training methods employed at Randolph Field, Texas, were observed for a ten-day period by two officers of the Republic of China, Lieut. Colonel Chiao Dawn Chiang and Lieut. Wego Chiang. They were accompanied by Colonel C.L. Chennault, former Air Corps officer, now serving as aviation advisor to the Chinese Government.

Following their stay at Randolph Field, the two Chinese officers were scheduled to go to Kelly Field, Texas, for a similar period of observation, and then to the West Coast on an inspection tour of aircraft factories and civil airdromes.

---oOo---

MAINTENANCE WORK ON AIRPLANES - OLD VERSUS NEW

Captain William T. Coleman, Air Corps Representative at the plant of the Bell Aircraft Corporation, Buffalo, New York, submitted the article given below in the belief that its publication in the News Letter might result in a comparative discourse between present-day airplanes and maintenance difficulties and the old type aircraft which formed the basis of our present-day inspection system.

The News Letter particularly welcomes articles along the line such as suggested by Captain Coleman. His contribution reads as follows:

During the course of some research study the undersigned came across a rather interesting book entitled "Military Aeroplanes" by Grover C. Loening, edited in the year 1918. An extract from this book, which might prove of interest in general to the pilots and maintenance crews of today's modern fighting aircraft, is as follows:

1. UPKEEP.

An aeroplane should really be kept in shape like a yacht, all parts polished and cleaned and oiled, with a very definite effort on the part of the crew to have everything spick and span. Particularly should oil be cleaned off of the wings and of wooden parts, as it so readily tends to rot them. Not only is this work desirable for looks, but it is a systematic way to inspect for flaws.

2. INSPECTION.

Once in the air, if nothing is wrong with the aeroplane, the flyer is absolute master of his own destiny.

On the contrary, if there is something wrong, he cannot "stop by the roadside and fix it".

So inspection of an aeroplane is of the very greatest fundamental importance and should never be neglected.

In fact, a good pilot, regardless of any foolish criticisms of "cold feet" on the part of less sensible rivals, will examine his machine carefully every time before going up, taking particular care if he has a passenger. And in addition, in the proper "esprit de corps" of flying, he will take no offense if his passenger does likewise to assure himself.

Because there is really no "come back" to something wrong with an aeroplane, and where there are unfortunately still so many little fittings and "gadgets", it is very wise to acquire this point of view from the outset.

In general, a quick, thorough inspection covers the following vital points:

Is the motor wiring and switch correct?
Does the throttle work properly? Is it loose or worn anywhere?
Is the propeller locked on?
Is there water in the radiator, oil and gas in the tanks?
Does the gas tank hold its air pressure?
Are the controls all connected up to work properly? Is there any unlooked for friction or lack of alignment?
Are there any loose bolts or unsafetied turnbuckles?
Particularly are the wing pins at the body joint properly locked?
Is the motor hood fastened down? And the rear fuselage cover?
The tail - is it properly fastened down?
Is anything going to jam a pulley or a control? Is your luggage or military load properly fastened in?
Is your safety belt really safe?
Have you a fire extinguisher handy?
Is there grease on the wheels?
Are the wheels held by the pins from slipping off the axle?
Run your motor a few minutes to see that it really "motes".
Take a good look around the field for wind direction and other aeroplanes!

---oOo---

RETREAT PARADE TO BECOME PART OF CADET TRADITION.

In the Flying Cadet Quadrangle at Randolph Field, Texas, a retreat parade was held on Sunday afternoon, December 18th.

Patterned on the Corps of Cadets at the United States Military Academy at West Point, the Flying Cadets went their "brothers in grey" one better by coming up with their own drum and bugle corps.

This, the first in a series of parades to be held during the incumbency of each class to be trained at Randolph Field, is planned to permit friends of cadets and visitors an opportunity to view the Battalion. Guides were stationed at various points throughout the field to direct visitors to the Cadet Quadrangle.

---oOo---

Flying Cadet Class 40-A, numbering 227 students, departed from Randolph Field on December 19th for Kelly Field, Texas, the Advanced Flying School, on the last leg of their journey, which will terminate with the Cadets receiving their wings.

This class, the largest ever to be graduated from the Primary School at Randolph Field, was also the first to be enrolled at the "City of Wings" from the Civilian Elementary Schools, under the Air Corps Expansion Program.

V-8323, A.C.

NAVIGATION INSTRUCTION IN 5TH BOMBARDMENT GROUP

Dead Reckoning and Celestial Navigation will hold no secrets from the 5th Bombardment Group, Hickam Field, T.H., in the future, as a result of the Air Navigation School, launched on November 1, 1939, with 1st Lieuts. Hugh F. McCaffery, and Paul C. Ashworth, of the 4th Reconnaissance and 31st Bombardment Squadrons, respectively, as instructors. The first class, totaling twelve officers, ten of whom are from the 5th Bombardment Group, completed their basic classroom work and are now flying navigation problems with marked success. As now contemplated, the course will last approximately three months and will consist of a total of 255 hours' classroom work and 70 hours' air work. A further breakdown of this time shows:

Dead Reckoning: 110 hours' classroom,
30 hours' air.
Celestial: 145 hours' classroom,
40 hours' air.

The school operates five days a week, Monday to Friday, inclusive, the hours being from 8:00 a.m., to 3:00 p.m., save on Wednesday, when class is dismissed at 12:00 noon. Flying is done in the afternoons.

"The school has received excellent cooperation from all agencies", Lieut. McCaffery reports, adding that "the Post Technical Library has furnished all the texts and equipment necessary, and upon receipt of the drift sights now on requisition, the school will be completely equipped.

"Continuation of the good weather, coupled with the permanently available wide expanses of open sea devoid of check points, should result in a fine crop of navigators."

---oOo---

BOMBARDMENT INSTRUCTION FOR ENLISTED MEN

The ancient belief that only Air Corps Pilots make good bombardiers stands a fair chance of being thrown into the discard, if the final results obtained from the Enlisted Bombardiers' School, now being conducted by the 5th Bombardment Group, Hickam Field, T.H., are anything like present indications. November 1, 1939, saw the opening of the class of 28 carefully selected enlisted men from the squadrons of the Group, under the personal supervision of 1st Lieut. Arno H. Luehman, Air Corps, Assistant Group Operations Officer. Theory of bombing, ballistics, and operation of technical equipment constitute the 14 hours of classroom instruction, followed by 7½ hours of bombsight operation on the ground, on completion of which 2½ hours of air tracking missions and 30 hours of actual bombing missions, during which each student drops a total of 60 bombs, complete the course. All students at this writing have completed the ground instruction and have progressed to air tracking missions, Lieut. Luehman reports. Weather permitting, the course was scheduled to be completed on December 15, 1939.

While the proficiency of bombardment units in the destruction of ground targets by means of projectiles dropped from aircraft has progressed by leaps and bounds since the World War, the defense of bombardment formation from attack by other aircraft has been somewhat slighted. Despite the axiom that the best defense is a vigorous offense, there is no discounting the fact that a determined enemy Pursuit organization, once in contact with our Bombers, can cause serious discomfiture to individual aircraft, and at least prevent a few Bombers from repeating the attack some other day.

With this in mind, the 5th Bombardment Group has been conducting a mass gunnery exercise, the object of which is to answer the following questions:

a. What types of formations permit the maximum concentration of controlled fire over all possible avenues of approach of Pursuit aircraft?

b. What are the best means of fire control?

c. What are the probablities of obtaining hits on Pursuit aircraft from ranges up to 1000 feet?

To obtain the above answers, the 23d Provisional Squadron, consisting of all units of this Group, under command of Captain A.V.P. Anderson, Jr., was formed for the period of the exercise. A special allotment of 100,000 rounds of ammunition was furnished for the test by the Chief of the Air Corps. When the test is completed, a total of 11 missions will have been flown, involving firing on from one to three towed sleeves by formation of from three to nine airplanes from all possible angles and dispositions. For purposes of comparison, and because of the difficulty of simulating attacking aircraft by use of a towed sleeve, the last two missions will involve attacks (Camera Gun) on the Bombardment formations by units of the 18th Pursuit Group, Wheeler Field, T.H. "It is believed", says the News Letter Correspondent, "that the mass of data obtained, when carefully compiled and analyzed on completion of the test, will reveal some very illuminating facts regarding our present defensive equipment and will furnish the basis for further improvements in connection therewith."

RETRACTABLE LANDING GEAR
By the Materiel Division Correspondent

Part II

When a designer starts work on the retractable landing gear for a new type of airplane, he knows that he can devise a mechanism which will retract in any direction. He has learned much from nature's solution as seen in birds - backward retraction of the leg against the body - but in the early days some of the retractable gears did not approach nature's reliability as evidenced occasionally in the headlines announcing that another gear had jammed in the retracted position and the pilot successfully had essayed a belly landing.

Essentially the designer proceeds as follows:

1. The plans furnish information on what the landing speed will be, whether a nose or tail wheel will be used, and the gross weight. From these the needed calculations can be made of the braking capacity needed. The braking capacity dictates the size of the wheel needed to house the brake. From the size of the wheel and the gross weight, a tire is indicated dependent upon whether a soft, medium, or high-pressure tire is required.

2. The necessary clearances govern the length of the landing gear. The propellers must clear the ground by nine inches. The structural clearances of the fuselage or any loads suspended beneath it such as bombs, smoke or gas tanks, as well as the clearances of the flaps in the down position, are calculated.

3. The over-all size of the landing gear assembly can now be estimated.

4. The designer now starts to look for a location to house the gear in the retracted position, hoping to find a place into which it can be fully retracted. He weighs each consideration: Retraction into the fuselage usurps extremely valuable space near the center of gravity. It must be used sparingly, for pilot, cargo, gas tank, bomb, or camera space comes first.

Retraction into the thick sections of the wings is usually an ideal answer in the low-wing monoplane, because this section generally will completely house the short landing gear structure of this type. Also, this eliminates the necessity of cutting holes in a monocoque fuselage.

Retraction into the outboard engine nacelles of multi-engine airplanes solves the problem of getting the larger wheels of the heavier airplanes into the thick section of the wing. This is a very efficient installation, as little fairing is required, and a wide tread which gives lateral stability is automatically attained.

5. He then provides the method of moving the landing gear assembly into the space selected.

6. The power unit to actuate the system is selected. Thus, if the airplane already has a hydraulic system, the landing gear system would be tapped into it, and the secondary system would logically be a hand pump hooked onto the hydraulic power system.

In simplest form, retraction is accomplished by rotating the landing gear as a unit about a pivot point on its upper end where it joins the airplane structure. Auxiliary brace members of the gear are displaced from their normal extended position to a secondary position, thereby causing movement of their pivoted ends and resultant movement of the main landing gear structure to the retracted position. In special cases, ingenious devices must be originated when an eccentric movement of the landing gear is required to manipulate it into the space available for housing it.

Whether retraction is accomplished into the fuselage, thick sections of the wings, outboard engine nacelles or into fairing on the structure, the designer's sole objective is to reduce greatly overall air resistance and so secure returns in greater speed and lower fuel consumption. The Air Corps requires that the gear raise to retracted position in 20 seconds; and that it lower and lock in landing position in 15 seconds. Requirement of the Civil Aeronautics Authority is up in 60 seconds, down in 30 seconds.

The visual indicators, which inform the pilot whether the wheels are up or down, sometimes had disadvantages in that they were difficult to read when flying into the sun, or had to be checked at two or more points, or did not indicate intermediate positions of the wheels. The latest type of indicators at Wright Field, which will be installed on all airplanes now in production, tells the pilot everything he must know at a glance. A single dial face mounted on the instrument board shows a small airplane and two pin-point lights. As wheels are raised or lowered, the wheels on the small airplane follow the same movement, so that intermediate positions are shown precisely at any time. The two pin-point lights are actuated by switches which close only after the lock-pins have locked the wheels in landing

positions. Supplementing the visual position indicator and signal lights, is a warning device (only one per airplane is permitted) actuated by means of the engine throttle.

Continuous research is conducted on fluids for hydraulic systems. The ultimate aim of this research is to find one fluid which will not boil away at temperatures up to 160° F., nor congeal at any temperature down to -40° F. or lower. As rapidly as possible the rubber and synthetic packings in hydraulic systems are being replaced by metal-seated valves and lap fits.

A principal advantage of the nose wheel is that greater braking force can be applied without nosing the plane over. To capitalize on this feature, dual brake installations are being developed to provide larger braking capacity. "Dual seal" inner tubes, which trap air in two compartments for greater safety, are being developed for nose-wheels. Studies are being made to improve the fit of tires to rims to prevent slipping when greater braking forces are applied.

Static and dynamic balance of tires and wheels are getting considerable attention, with the objective of eliminating the detrimental vibrations often set up just after take-off when the wheels are spinning free. At present, pilots control this vibration by applying the brakes just after take-off.

---oOo---

LOWRY FIELD'S BOMBING RANGE

The bombing range, located about 6 miles southeast of Lowry Field, is in constant use by the Armament Department of the Denver Branch of the Air Corps Technical School. A great many live bombs and dummy bombs and thousands of rounds of ammunition are being fired daily on this immense range, which is approximately 100 square miles in extent.

The News Letter Correspondent believes that in the near future the bombing range area will be cross-lined in red on all airways maps as a prohibited area, anticipating that the bombing range will be used constantly and the dropping of live bombs or firing of machine guns will create a great hazard to aircraft which might venture across this restricted area.

---oOo---

Lowry Field's permanent personnel was increased by the transfer of 30 enlisted men, who in the past have been carried on detached service from their parent organizations, and now become permanent instructors in the three departments of the Denver Branch of the Air Corps Technical School.

RESERVE OFFICERS "BONING" FOR EXAMINATION

Reserve officers at Albrook Field, C.Z., are attending two classes daily, each lasting one hour, in preparation for the examination for permanent commission to be held early in January.

The classes are in Navigation and Engines, and are held in the Operations Office of the 29th Pursuit Squadron from 2 to 4 p.m. daily, under the direction of 1st Lieut. Robert D. Gapen; Navigation is taught by 2nd Lieut. John Hester; and engines by 2nd Lieut. Clint Wasem.

Officers attending the classes include 2d Lieuts. John P. Breckenridge, H. Von Tungeln, Paul M. Brewer, Albert A. Cory, J. Garrett Jackson, Robert Baeseler, M.P. Camp, John B. Henry, Jr., James D. Mayden, R.B. Mueller, Ralph Pusey, K.L.Riddle, J.C. Smith, W.E. Stinson, W.H.Swanson, Leon W. Gray and W. Weltman.

---oOo---

ACTIVITIES OF FLYING CADET TRAVELING BOARD

The Traveling Flying Cadet Examining Board of the Ninth Corps Area, of which Major E.E. Alder is president, will make its headquarters at Grand Central Flying School, Glendale, Calif., site of one of the Training Detachments, for two weeks beginning January 20th.

During this time, the Board will sit at the University of Southern California, University of California at Los Angeles, and Pomona College.

An "Army Aviation Day" will be staged the day the Board arrives, to call public attention to the recruiting campaign, which already is receiving considerable notice. One Los Angeles newspaper devoted nearly a full page to pictures and stories about the Cadet Board's activities.

---oOo---

CONGRESSMEN VISIT GLENDALE FLYING SCHOOL

The Congressional Committee of 18 senators and representatives which has been touring the Army establishments of the United States, Central America and Panama, were the first to see the Flying Cadets at Grand Central Flying School, Glendale, Calif., in their new uniforms.

The resplendent uniforms, just completed the previous day, feature a deep blue zipper blouse with shoulder insignia of brilliant red and blue, and gleaming gold. Lighter blue trousers and flight cap are worn with it.

---oOo---

WRIGHT FIELD OFFICER AUTHOR OF BOOK

By the Materiel Division Correspondent

Recently received from the Williams and Wilkins Company, Baltimore, is a new book, "Principles and Practice of Aviation Medicine", by Capt. Harry G. Armstrong, B.S., M.D., Director of the Aero Medical Research Laboratory of the Materiel Division. Neatly bound in blue cloth with gold lettering, the book contains more than 400 pages of, for the most part, new and previously unpublished material. Within the covers it has been Captain Armstrong's purpose to present everything a flight surgeon must know about selection and care of the flyer; a modern basis for the investigation of the effect of flight on man, physiologically and psychologically; evaluation of the existing remedies for adverse conditions; and the further development of corrective measures. The medical terminology is reduced to a minimum, consistent with the scientific nature of the book, and aircraft designers, operators, and pilots will find information they can readily absorb and that will be invaluable to them for the accomplishment of further advance of safety in aviation.

The book, Captain Armstrong says, has been prepared primarily as a textbook for students and as a reference work for those actively engaged in the practice of aviation medicine. Of the latter, including medical examiners for the Civil Aeronautics Authority, there are at present approximately a thousand in the United States.

More than one-fourth of the material is devoted to the result of original research performed by Captain Armstrong and his staff in the Laboratory at Wright Field. Historically, the book is also of value, and Captain Armstrong discusses among the works of early scientists that of Dr. Paul Bert, who in 1878 discovered the fact that balloonists ascending to high altitudes were affected by lack of oxygen, and undertook to solve the problem.

Captain Armstrong's first intention was merely to collect and classify for ready reference all available existing aero medical information produced in this country and Europe. Much of this was isolated in medical reports and papers not easily obtainable by individuals.

As his work progressed, however, the need for presenting new material along with that already in existence caused him to change the pattern of his work from a lengthy report for Air Corps research purposes to a book. The collecting of material extended over a period of four years, two of them having been given to the preparation of the book.

The only other general textbook on aviation medicine to be written in this country was that prepared by Colonel Louis H. Bauer, of the Bureau of Air Commerce, Medical Section, in 1926, and while still of definite value, it was published before many recent discoveries had been brought to light.

Captain Armstrong came to Wright Field on September 15, 1934, to organize the Aero Medical Research Laboratory, the only one of its kind in the country. Interest in aviation medical research arose during the World War period, and until 1920, when it was discontinued, there had existed at Mineola, Long Island, an Air Service medical research laboratory. The extremely high speeds and great altitudes characteristic of modern airplanes in recent times, however, brought back sharply the need for study of the physiological reaction of flight upon pilots. The "blacking out" experience in high speed turns was one of many evidences of such need.

During the period of Captain Armstrong's directorship, many valuable experiments have been accomplished. In this work he has never hesitated to take his turn as the guinea pig, when human reactions were sought. His work has won wide recognition for his oxygen researches. Scientists from many other laboratories come to consult him upon his own and related work. Recently he was honored by election to the first vice-presidency of the Aero Medical Association of the United States.

Since statistics show that nearly 2,000,000 people in the United States are taking to the air each year and since the health and comfort of each deserve consideration, the new book is bound to prove an extremely valuable one in its field.

---oOo---

RETIREMENT OF MASTER SERGEANT PETERS

Master Sergeant Frank A. Peters, of the 63rd School Squadron, Kelly Field, Texas, has been placed on the retired list, effective December 31, 1939. Entering the Army in March, 1911, Sergeant Peters has served overseas during the War, a tour of duty in the Philippines, and on the West Coast. From 1919 to 1923, he was an instructor in military tactics at the University of Washington. He has been stationed in San Antonio since 1926, joining the 63rd School Squadron at Kelly Field three years ago.

V-8323, A.C.

73D BOMBARDMENT SQUADRON BEGINS NAVIGATION CLASS

Now that the 17th Bombardment Group, March Field, Calif., completed its dead reckoning navigation school, it falls to the lot of individual squadrons to further that training by conducting similar schools within their organizations.

The 73d Squadron has added four new names to its list of official dead reckoning navigators as a result of the completed course of instruction by the group, namely, 1st Lts. Aaron W. Tyer, Joseph Brier; 2d Lts. Murray A. Bywater and Victor L. Anderson.

In cooperation with the Group's future training program, the 73d just commenced its dead reckoning class of eight officers. It is estimated that in approximately six weeks' time these officers should complete the entire course, both ground and practical navigation, and receive their diplomas as recognized navigators in dead reckoning.

The officers taking the prescribed course of instruction include 2d Lieuts. A.C. Carlson, F.B. Gallager, C.J. Heflin, G.C. Leland, R.S. Mason, W.G.Thornbrough, D.S. Dunlap, J.G. Schneider. Lt. M.A.Bywater is designated as instructor.

---oOo---

AIR CORPS ENLISTED MEN ACT PROMPTLY AND SAVE MAN'S LIFE

Two men of the 19th Pursuit Squadron, Wheeler Field, T.H., have been the recipients of letters of thanks and commendation from several sources since the evening of September 2, 1939. On that particular evening, Corporal Lloyd D. McKenzie and Private, First Class, Manning F. Ford, were engaged in repairing their automobile on the Kamehameha Highway, near Aiea, when another car, driven by Richard A. Girton, of Honolulu, crashed into a heavy wooden retaining fence. The two enlisted men ably took charge of the situation by extricating Mr. Girton and applying first aid to his smashed leg. Doctor Richard J. Mansfield pointed out that the immediate first aid applied by the two men saved the life of Mr. Girton who would otherwise have bled to death. The Service can well be proud of the quick and intelligent action of these two men. Cpl. McKenzie is a clerk in the Squadron's Headquarters Section, and Pfc. Ford is an AM, 2d Class, in the Squadron's Engineering Section.

---oOo---

Sixty-seven experienced mechanics and clerks from Kelly Field were among the first group to be transferred recently from that field to March Field, Calif., as past of the Air Corps Expansion Program.

BROOKS FIELD ONCE MORE A FLYING SCHOOL

Brooks Field, Texas, recently made a sub-post to Kelly Field, is rapidly preparing for the influx of its first group of Flying Cadets since 1931, when it became the home of the 12th Observation Group after primary training activities were transferred to the newly-opened Randolph Field in that year.

With the Air Corps expansion in full swing, Brooks Field will again harbor Air Corps student fliers, who will be in their advanced training period on arrival there. Due to the extremely large classes training under the expansion program, the Advanced Flying School, in addition to the four sections at Kelly Field, will have a fifth section in training at Brooks Field, where Colonel E.A. Lohman, Assistant Commandant of the Air Corps Advanced Flying School, is now in command. Captain L.H. Tull, formerly Assistant Supply Officer at Kelly Field, now heads Air Corps Supply at Brooks Field, with 1st Lieut. R.E. Ellsworth being transferred to Brooks Field as the new Adjutant of that post.

---oOo---

KELLY FIELD GATES UNDER GUARD

Greatly increased activities at Kelly Field, Texas, incident to the Air Corps Expansion Program, have resulted in a complete revision of the police and traffic system at the field. The vast amount of construction under way on the post, the increase in number of automobile-owning personnel, and the constantly growing interest of the public in Air Corps training have swollen the traffic problem until drastic steps have become necessary to reduce the congestion. Only two gates to the field are now open, and vehicles and individuals must now be provided with the proper permits to enter and leave the post.

Guard shelters have been built, and guard is maintained on a twenty-four hour basis at these gates.

---oOo---

CONSTRUCTION UNDER WAY AT KELLY FIELD

New buildings are springing up like mushrooms at Kelly Field, where evidence of the increased activities is rapidly taking shape in the form of new hangars, barracks, officers' quarters, and office buildings. Several of the new homes for officers, started July 1, 1938, are practically completed, while the large cadet barracks building is well under way. Overshadowing all the others in size, however, is the huge new hangar just taking shape, with the skeleton framework giving an idea of the immense structure being erected. When completed, the building will be about 100 feet high, with a floor area 300 by 375 feet.

MATERIEL DIVISION ENGINEERS USE REFRIGERATED WIND TUNNEL FOR RESEARCH ON DE-ICING EQUIPMENT

(Second of two articles on De-Icing).

Materiel Division engineers, through the courtesy of the B.F. Goodrich Company, are permitted to use the refrigerated wind tunnel in Akron, Ohio.

This is a tremendous advantage over less fortunate research engineers in many countries, who have to await location of suitable icing conditions in the sky to accomplish icing research on an "if and when" basis.

Doubtless this is one reason why the United States has produced the best of existing de-icer systems, as judged by service records and purchases for airline and military airplanes.

The various schools of thought on de-icers are based on three principles: (1) Chemical, (2) Thermal, (3) Mechanical.

(1) In the chemical group, little success has been found except for protection of propellers, where centrifugal force augments the chemical in throwing off under-cooled water particles. Dry surface coatings, lubricants, continuous application of liquids which lower the freezing point of water, and various pastes all fall short. Some actually increased the rate of ice formation.

(2) Although engine exhaust heat seems to be theoretically ideal, the weight of present radiators and distribution pipes is excessive for airplanes. Further research may produce a satisfactory thermal system. The principal use of heat in ice protection now is the carburetor heater which effectively prevents carburetors from icing up.

Theoretically the motors of an airplane lose enough exhaust heat to maintain a temperature sufficiently high on leading wing surfaces to melt ice, but whether a system can be designed which will melt ice as fast as it can form under severe conditions without decreasing the fuel or pay load too much is still questionable.

(3) The Goodrich mechanical de-icer, developed over a period of years in the refrigerated wind tunnel in Akron, Ohio, is generally accepted as the best present de-icer. It is used in a number of countries throughout the world, and by commercial airlines and the Air Corps in this country.

It consists of a sheet of vulcanized rubber, backed with extensible fabric to resist tearing, with one or more inflatable tubes (depending on the size of the airfoil) into which air under 7 pounds pressure is pumped.

The inflatable tubes run longitudinally along the leading edge. They are connected by tubing within the structure of the airplane to an electrically driven distributor valve which controls periodical inflation and deflation by an air pump. On a large airfoil, such as the wing of the B-15, as many as 5 inflatable tubes have been used. They are inflated alternately, with a rhythmic inflation-deflation cycle of about 9 seconds, somewhat slower that a rippling action, but shown by tests to be more practical and efficient. The de-icer lies flat on the airfoil, covering the region where under-cooled water particles strike. The trailing edge is fastened by rivnuts and fairing strips which hold the de-icer taut when not in use.

In operation, when ice begins to form upon the surface of the rubber sheet covering the leading edge, air is introduced at the most efficient time intervals; the inflatable tubes round out, stretching the whole sheet; the ice while still in thin layers is lifted, loosened, and broken. The tubes are then quickly deflated and the loose ice blows away.

After turning the de-icer on, the whole operation is automatic as far as the pilot is concerned. An automatic control has been developed at Wright Field which relieves the pilot of even the necessity of turning on the de-icer. This "ice-detector" has passed experimental tests and will shortly be in the service test status.

Ice does not affect operation of an airplane radio unless the formation completely covers the insulator and forms a circuit around it. De-icers for radio compass loops and masts work on the inflated tube principle, and should be carried to prevent loss after the ice burden sets up a vibration. Smaller loops in streamlined housings do not require de-icers. One Air Corps pilot, flying through bad icing strata, suddenly lost a generous portion of a wing. A radio mast, heavily weighted with ice, vibrated off into a propeller, which flipped it out and through the wing. Antenna wires installed transversely rapidly pick up enough ice to snap in icing conditions; installed in the direction of the airstream, or not over 20 deg. from this position, icing is much slower.

An entirely separate system (anti-icing equipment) prevents formation of ice on propellers. This consists of a tank of fluid (15 parts of glycerin mixed with 85 parts of ethyl alcohol), a pump which meters out the fluid as needed, and a "slinger ring" attached to the propeller with a separate delivery tube for each blade.

The centrifugal force developed by

the whirling blades serves not only to distribute the fluid over the surface of the blades but also tends to whirl the under-cooled water particles out and away rapidly after impact.

Depending on illumination and visibility of a leading edge relative to the pilot's position, formation of ice may be discovered by sight; by logy controls; by a sudden, foreign vibration; by inability to climb; or loss of altitude.

Pilots who have had considerable experience with ice agree that the best precaution is to stay out of it, if possible, or get out of it as fast as possible. Like a trip to the dentist, it's rarely fatal with the protection of de-icing equipment, but there's a distinct relief when it's over.

Some general rules are included in instructions to pilots:

"In going through icing strata, from the viewpoint of time exposed, the greatest possible rate of change of altitude (with low forward speed) should be used. In climbing, maximum allowable power should be used; a descent should be made with as steep a glide as other safety conditions will allow, with full carburetor heat applied.

"It should be remembered that the control of an airplane may be very seriously affected by small changes in the shape of the leading edge of control surfaces, thus a relatively small deposit of ice in any form at such points may be serious from this consideration.

"Pilots are particularly cautioned that when flying under conditions in general favorable to ice formation, the rate of deposit may be expected to increase very rapidly after the initial formation.

"As the operation of the de-icing system on airfoils affects the aerodynamic characteristics of the airplane, the system should not be operated while landing the airplane or in any other attitude of flight in which the airplane approaches the stalled condition."

All the meteorological conditions which are responsible for those physical states of water that result in its changing to ice on impact with an airplane belong to a highly specialized science which is still looking for answers. Use of the standard de-icer by skillful pilots has reduced the ice hazard in recent years.

Some years ago two airplanes of the same type were flown together on a 200-mile trip. A bad icing area was encountered. At the end of the flight, one airplane was so heavily iced that the pilot barely avoided a crash; the other airplane was not iced at all. Its pilot had maintained an altitude of 200 feet above the plane which almost was forced down by ice. He was not even aware of the icing hazard on the trip until he saw the other airplane after landing.

It is the opinion of Materiel Division engineers that the future de-icer will employ the inflatable principle of the one now in use.

It will be more readily attachable and detachable. (It requires about 50 man-hours to install a de-icing system on a Bomber; to detach, about 6 man-hours.)

It will have a longer service life. (Two or three years is considered the maximum life of present systems.)

It will not affect the aerodynamic characteristics of the airplane when not in use. (No measurements of the de-icer's effect on lift or speed have been published. Recent changes in the rivnut and fairing strip method of attachment resulted in a smoother, neater job.)

Two additional improvements have been made lately; a synthetic rubber with more weather resistance replaced the former soft, pliable type. A coating of graphite increases its resistance to sunlight, and also increases conductivity so that the de-icer leads electrostatic charges out of its trailing edge into the airplane, where before there was some chance of the charge burning a hole in the de-icer.

Use of the refrigerated wind tunnel will accelerate future research in the problems involved in the protection of small streamlined surfaces, on which ice collects in relatively larger layers than on large surfaces.

As a result of studies published on icing of ailerons and movable controls, manufacturers can now design these surfaces to afford a maximum precaution against icing.

Systematic research may be expected in icing problems presented by windshields, pitot tubes, radio parts, nose, pontoons, landing and running lights, and rivet heads, as well as continued improvement of de-icers for large airfoils of the future.

Note: Part I of the above article appeared in the issue of the News Letter of November 15, 1939.

---oOo---

Under date of December 5, 1939, the Chief of the Air Corps advised that funds in the amount of $10,545.00 were being allotted to Randolph Field, Texas, for the installation of fireproof insulation and heating facilities in the Dope Shop, Building No. 38. This installation will permit the maintenance of proper temperatures for the repair, painting and doping of airplane parts in all types of weather.

---oOo---

WRIGHT FIELD EQUIPMENT EXHIBIT
By the Materiel Division Correspondent

The exhibit of the Equipment Laboratory prepared for the visit of the National Advisory Committee for Aeronautics at Wright Field in November contained more than five hundred items of equipment considered essential to the successful operation of military aircraft. One of the highlights was a group of twenty-nine lamps, ranging from one-half as large as a peanut, which operates on one and one-half watts and three volts, to a 10,000-watt bulb which is almost as large as a man's head. The smallest bulb finds a use in the illumination of aircraft instruments, each instrument containing a bulb. The largest bulb is used in airport floodlights. The twenty-seven lamps in between these two sizes also have essential uses.

Another highlight of the exhibit was a comparison of the commercial electric motors with aircraft electric motors. The commercial motors, rated at 2 hp. and 5 hp. respectively, weighed 165 pounds and 171 pounds and operated at approximately 1750 r.p.m. Aircraft electric motors, rated at 2.5 and 8 hp. respectively, weighed 7 and 16 pounds and operated at 22,000 r.p.m.

Mr. Clinton M. Hester, Administrator, Civil Aeronautics Authority, evinced considerable interest in this electrical equipment which included the latest types of runway marker lights, runway reflectors (which are similar to the reflectors often used on highway signs to make them visible with the aid of the lights from the approaching automobile), airport floodlights, the large Type B-5 wind direction indicators and portable obstacle lights with intermittent neon glow tubes, which operate through suitable transformers and vibrators from a 6-volt storage battery. The complete self-contained portable obstacle light assembly weighs approximately 100 pounds. The latest night lighting control cabinet operates like a dial telephone - dial a particular number to light a particular light and another number to turn that light out.

All members of the Committee were interested in accessory power plants. The sample in the exhibit was a 4-cylinder air-cooled internal combustion engine using a vertical shaft to drive a 7.5 KVA alternator at 4000 r.p.m., generating three-phase electric power at 110 volts and 400 cycles. The complete accessory or auxiliary power plant weighs less than 200 pounds, and it is designed for installation in aircraft in an effort to remove some of the accessory generators from the rear of aircraft engines, since this location is extremely crowded today and aptly termed "no man's land". The further development of accessory power plants may succeed in removing many of the complications of the back of an engine by making it no longer necessary to drive a fuel pump, oil pump, air pump, and electric generators by the engine.

Dr. Fannevar Bush, Chairman of N.A.C.A; Dr. Lyman Briggs, Director of Bureau of Standards, and Dr. George W. Lewis, Director of Research of N.A.C.A., were surprised at the multitude of items of auxiliary equipment required by military aircraft. These items included an emergency jungle kit, consisting of a latex sponge rubber pad with a compartment for carrying the following equipment: a large knife known as a "machete", a compass, cartridges for .45 Cal.pistol, iodine, quinine, matches, mosquito head net, fish hooks and line, and two Air Corps emergency rations. The jungle kit forms part of the back pad of the parachute harness. Another item is a life preserver vest which is inflated in an emergency to provide buoyancy in case of forced landings in water. This vest has been in common use for several years. Other items are an emergency shelter tent, mattress, and sleeping bag. The shelter tent is large enough to cover a man while he sleeps. The mattress is inflated with air very simply by connecting it to the bottom of a rubber "laundry bag" of rubberized fabric. The open end of the laundry bag is opened wide to catch some air. It is then rolled, forcing the air out of the bottom into the mattress. After three such operations, the mattress is full and ready for use. The sleeping bag is lined with blankets. The occupant wraps this around him and pulls the zipper up one side to make himself comfortable for the night.

Also exhibited are portable jacks, operated hydraulically by hand-pumps, with a lifting capacity of 50,000 pounds, and another smaller unit with a lifting capacity of 10,000 pounds; cast aluminum chocks to replace the wooden chocks which have been used for twenty years; mooring anchors, which, when driven into the ground, furnish a secure link to which the wings and tail of an airplane may be tied, when it is moored out in the open on a strange field; tow targets and windlasses for handling them; flying suits and various other types of clothing, including electrically heated gloves; also pneumatic rafts. The large Type B-12 anti-aircraft tow target, with the smaller Type A-5 aerial gunnery tow target, was suspended from the roof of the exhibit and overflowed into the ad-

joining offices. The two pneumatic rafts on exhibit were inflated and suspended on the wall. The Type B-2 is a small raft carried in Pursuit airplanes on flights over water and will support one man; the large raft is carried on Bombardment airplanes and will support an entire crew of ten men.

Colonel Lindbergh, Dr. Edward Warner, and Mr. Hester tried out the new shoulder type of safety belt. Little changes have taken place in the development of safety belts for ten years or more. However, this new shoulder type is a distinct step forward, inasmuch as in addition to the belt over the pilot's lap there are two shoulder straps fastened to the upper corners of the seat and extending down to the same releasing latch. The shoulder straps will prevent the upper portion of the pilot's body from falling forward in violent maneuvers as well as in crashes, and its release involves no additional complications. Slipping the latch releases the shoulder straps as well as the lap belt.

The exhibit contained a complete set of standard and service test models of aircraft engines and flight instruments, navigation computers, charts, tables, and sextants. Commander Reichelderfer and Captain Kraus made a thorough inspection of the Type C-1 field testing set, which is a portable buggy like a baby carriage, containing electric motors, air and oil pumps, and a set of master instruments which enable mechanics to check the operation of all of the instruments on an instrument board in a military airplane.

The exhibit in the Aero Medical Research Unit was visited individually by Dr. Lewis and Colonel Lindbergh and later by the remainder of the group. Colonel Lindbergh, probably as a result of his researches in collaboration with Dr. Alexis Carrel on the "artificial heart," was particularly interested in the human element in flight and revealed that he had carried on a certain amount of this work himself. Of particular interest to all of the members of the group were the photographs and charts illustrating the effect of oxygen want and the decrease of atmospheric pressure at high altitude and also the effect of acceleration on the human body.

Mr. Orville Wright was very much interested in the number of aerodynamic principles which have been utilized in flight instruments. Dr. Warren and Mr. Hester thoroughly inspected instruments for recording acceleration, velocity, and other factors during flight. Colonel Lindbergh made sure that he was brought up-to-date on the latest engine and flight instruments and the latest methods of celestial navigation.

The Materiel Division has fostered the development of automatic methods of control to a greater extent probably than any other organization in this country. The display of the Equipment Laboratory included the automatic pilot with its many refinements, semi-automatic computers, an automatic engineer, and devices for controlling the flight of airplanes of various sizes from the ground. Because of the limited time, no attempt was made to explain in detail the operation of these various devices. The automatic engineer was inspected as installed and operating in one of the airplanes assigned to the Equipment Laboratory for flight tests of its developments.

---oOo---

GRADUATIONS FROM A.C. TECHNICAL SCHOOL

On December 1, 1939, a total of 103 students graduated from the Air Corps Technical School, Chanute Field Branch, from courses and stations as indicated below.

	Courses of Instruction					
Fields	PC	PR	CS	RR&O	ES	IS
Barksdale	2	2	1	-	1	2
Bolling	-	-	-	2	1	-
Chanute	-	2	-	2	1	1
Chicago	-	1	-	-	-	-
Duncan	1	-	-	-	1	1
Hamilton	-	1	1	2	1	2
Kelly	-	-	-	1	-	-
Knox, Fort	1	-	1	-	2	-
Langley	3	2	2	7	3	2
Lewis, Fort	-	-	-	1	-	-
Lowry	-	-	-	3	-	-
March	3	2	-	2	2	3
Marshall	2	-	-	-	1	-
Maxwell	-	-	-	1	1	-
Mitchel	-	1	1	1	1	4
Moffett	-	1	1	2	1	1
Offutt	-	-	-	-	1	-
Pope	1	-	-	-	1	1
Randolph	-	-	-	1	1	2
Riley, Fort	-	-	-	1	-	-
Selfridge	1	1	-	2	1	1
Sherman	-	-	-	1	-	-
Total	14	13	7	29	20	20

Key:
- PC - Propeller Specialist
- PR - Parachute Riggers
- CS - Carburetor Specialist
- RR & O - Radio Repairers and Operators
- ES - Electrical Specialists
- IS - Instrument Specialists

---oOo---

The Congressional Committee which has been visiting Army installations for the past thirty days, visited Lowry Field, Denver, Colo., on December 9th, under the chairmanship of Senator Thomas of Oklahoma. Four Senators and four Representatives inspected the construction and facilities at Lowry Field. After a luncheon, which was tendered them by Colonel Jacob H. Rudolph in the general mess of the School building at Lowry Field, the visitors proceeded on to Fort Logan, Utah, for their inspection.

PROMOTION OF AIR CORPS NONCOMMISSIONED OFFICERS

Effective December 12, 1938, the following-named Technical and First Sergeants of the Air Corps were promoted to the grade of Master Sergeant, Air Corps, to fill existing and newly allotted vacancies:

John E. Carden	John McStay
Sidney Miller	Raymond Kerr
Harvill B. Srote	August W. Keuhl
Basil Zaphiro	Walter Simpson
Edward J. Urweider	John Lukowski
Louis T. Silva	John B. Deming
Daniel Stone	Mack Reynolds
George A. Eggeling	Harold E. Crawford
Andrew J. Halsey	Robert B. Norris
Robert L. McKinstry	Robert Miller
Shockley D. Mullinix	Alex Kacziba
Peyton E. Hutchens	Charles E. Wendell
Oliver Olson	George W. Froberg
Edward A. Jusko	John Howard
Marvin E. Hay	William K. Sheffield
Ray R. Willett	William Mehnert
Michael Protivnak	Myron Roeske
Charles Joyner	Phillip P. Monroy
Roy D. Cheatham	Nikolas Thermenos
Harry Balacke	Walter H. Campbell
William Fitzpatrick	Reuben B. Morris
Edward P. Polaska	Arthur C. Barker
Walter T. Neary	Claude M. Gilbert
Walter W. Fry	Frank J. Birk
Leonard L. Hoffman	Fred A. Roberts
Adam J. Vielock	Floyd H. Peacock
Karl R. Johnson	Joseph Bauer
Thomas F. Toohey	Jack Wolfe
Lafe Teverbaugh	Joseph M. Fredericks
Victor Vicsik	Henry M. Merkle
Tony Dembroso	Mike Biniakiewicz
Manuel Silva	Henry L. Franklin
Michael M. Rozburski	Dave Jacobson
Ras I. Kirby	Graham Platt
Henry Camire	Morris A. Aubree
Jacob Abromitis	Besola Cobb
Leonard Miramontes	Harlan R. Utterback
William Hoffman	Walter D. Brown
Harry B. Aaronoff	Claud Emerson
Theodore Yurkiewicz	Max Eisenberg
Edward B. Fiedler	Henry Kirby
Richard F.J. Martell	Michael E. Connelly
Henry M. Ruhs	Sidney M. Rahn
Benjamin Webb	Harry N. Fuecker
John T. Hoyle	Earl S. Blesh
John A. Mauro	August Schantel
Robert H. Greene	Walter E. Banas
Roscoe O. Smith	Gerald G. Whitaker
George S. Jones	William H. Jernigan
Russell H. Frick	Robert L. Barlow
James M. Caldwell	Elza L. Higbie
Joseph H. Pust	Harry E. Hite
Matthew A. McGraw	Charles M. Cross
Robert E. Rice	Raymond Lutz
Charles R. Bikle	Harley J. Fogleman
Joseph J. Chinigo	James E. Searborn
Orient M. Durling	Edgar W. Gardner
Samuel Silberman	Leonard Williams
Harry Hicks	Roy Wooten
Joseph Kramberg	John A. Marshall
Edwin Paseman	Albert V. Kanig
James C. Elder	Edwin J. McClellan
Clarence N. Reily	Louis Greenberg
James A. Maginness	Francis M. Passwaters
William R. Taylor	Gilbert L. McMurrin
Eli B. Nipper	Edwin B. Bernier
Bruner R. Coke	Grover C. Moss
George W. Halterman	James J. Murphy
Edwin M. Lawrence	Miles B. Sloan
John S. Bezek	James E. Stewart
Earl H. Browning	Johnny V. Yocum
Louis V. McKenney	Joseph Montgomery
Asa C. Hoober	Rufus L. Clifton
Henry W. Spiller	Thomas A. Jones
Horace R. Ackerly	John H. Gorse
Willie E. Newman	John F. Moran
Alphonse Gaudette, Jr.	Anthony Kievet
George D. Malkemas	Frederick Lawrence
Clarence E. Bright	James R. Tucker
Alfred A. Brooks	C.N. Guttenberger
John H. Moore	Joseph O. Ducheane
Taylor C. Carr	Daniel H. Jones
Jessy C. McConnell	Louis A. Kirby
Homer L. Patterson	Fred M. Haga
Arthur E. Pfenninger	Frank Hurst
Marion S. Tilghman	Homer E. Ferguson
Ernest Levesque	George W. Gaspard
Wilbur W. Farquhar	Edward F. Skelton
Harold P. Benson	Emmett A. Mobley
Lloyd Carter	Henry D. Boudreaux
Michael Chuturich	Cecil C. Seguine
Elmer E. Moore	John C. Dodd
Frank E. Dixon	Samson Smith

Effective December 12, 1939, the following-named First Sergeants and Staff Sergeants were promoted to the grade of Technical Sergeant, Air Corps, to fill existing and newly allotted vacancies:

First Sergeants

Robert R. Elliott	William H. Heller
David L. Johnson	Earl L. Tolby
Hubert G. Powell	Russell M. Highley
Rupert E. Ferguson	Kenneth L. Thayer
LaVern A. Fee	James W. Porter

Staff Sergeants

Houston Alexander	Louis V. Eanes
Ira C. Lee	Baus C. Byrd
Donald F. Ewald	Charles C. Cunningham
John Smith	David L. Fredenburg
William E. Perkins	Cullen M. Snipes
Clarence D. Green	Frank R. Welsh
Frederick H. Remke	Kazimir M.A.Witwicki
Thomas W. Thompson	Albert W. Johnson
John Bouzek	James Adams
Max Parnes	Joseph J. Eberling
Wladyslaw Dobski	Alphonse Potvin
Henry Fennel	Anthony J.Olszanowicz
Eugene Gubis	Denver Wood
John H. Stipe	John F. Carter
Elmer Bruss	George H. Cornell
Harold M. McCabe	Elvin C. Ingram
Ashby M. Ash	Chris Nelson
Everett Mickey	Allan D. McQuaig
Herman C. Prast	Dennis W. Bailey
Clarence S. Rublee	Alfred Fernandez
James E. Hamer	John C. Willis
Thomas P. Atkinson	Gustav Sonnenburg

Albert E. Stewart	Allen B. Neal
John N. Van Gundy	Wilbur C. Johnson
Stanley Modzeleski	John R. Thompson
Blackburn H. Litten	Walter D. Carlos
George H. Carpenter	Lambert Tunberg
Roman Dubiel	Charles E. Garten
Harvey D. Masters	Donald S. Velliquette
Erwin Meiserick	Roger Penrod
William A. Richards	Robert Zernikow
George W. Cookson	Joe McCollum
	Luther O. Wilkins
William T. Mayes	Edwin L. McNary
Merton E. Wood	George Moore
George R. Thompson	Peter Munch
Isadore Oricht	Elden L. Rose
Lewis Williams	Frank L. Adcock
Joseph A. McCarson	George E. Chalmers
Edward J.P. Bergbauer	Fred L. Pike
Harold G. Anderson	Harry T. Brock
Lafayette Braungardt	Marvin W. Woodson
William K. Keister	Anthony Groves
Richard M. Tennant	Earl J. Leavey
Dae Hext	Jack Casper
Vernon J.R. Loosemore	Martin M. Feigley
George J. Parker	Walter E. Schwager
Hugh Thomas	Paul Leonberger
Joseph Glass	Yancy B. Kuykendall
Norman W. Haley	Harrison C. Finley
Robert C. New	Grover C. Owen
Mack Gibson	Bryan I. Doughty
Thomas J. Rogers	Dezo Romanovicz
Edwin N. Olson	David Fountaine
Russell H. Miller	Eugene H. Ford
Fred B. Lingenfelter	Rudolph Petek
Frank Bayne	Joseph L. Steurer
Erik Z. Lindhe	Oscar L. Klapp
Earl D. Spore	Harvey R. Davis
Samuel F. Lantz	Melvin K. Burlingame
Floyd L. Banks	Andrew R. Schady
Bert M. Dumas	James R. Booth
John Hanlon	Joseph M. Savoy
Wayne M. Musser	Fremont R. Alford
John Arney	Kyran L. Maher
Tyne E. Hawkins	Thomas P. Brisley
Everett A. Sell	John Knier
Arthur L. Cron	Charles L. Garber
Wallie Robinson	Paul M. Welwig
Fred J. Wymore	William A. Johnson
George Russell	Walter W. Weisner
Edward Ingle	Murl M. Clark
Lester M. House	Harold E. Norton
Levi A. Freed	Gordon Brackett
Joseph E. Warrick	Elwood Adams
Louis Rubby	Richard McDowell
Nelson E. Morgan	Joseph T. Landry
Meriweather, Wm. F.	John J. Hoffman
Lionel C. Edwardes	Joseph O. Schreck
William Stone	Edgar L. Krug
Joseph A. Hoffert	Thomas E. Stewart
Frederick E. Ganshaw	Asher Goldfine
Junious A. Smith	Harry Shilling
Roy C. Jackson	Hurley E. Jaynes
John S. Welch	Eugene W. Latham,Jr.
Richard E. Meeks	Joda E. Maynard
Frederick A. Howell	Lawrence J. Trost
William A. Wesley	Green R. Fiest
Elson E. Miller	Ralph H. Roberts
John A. Brock	John G. Morris
John E. Doyle	Gordon R. Sohrweide
Roy C. Cook	John J. Conroy
Charles McDonald	Martin J. Cummings
John A. Courtney	Harvey Liddon
Frank M. Stansell	Richard Olson
James F. Vickery	Tyra O. Robinson
Douglas M. Alward	Benjamin Hoffman
Robert W. Stevens	James M. Kirby
Herbert G. Spees	Alfred I. Taylor
Clarence A. Dively	James B. McCormick
Frederick W. Seidler	William H. Alvord
James H. Crawford	Thomas B. Walker
Frank E. Lyons	Everett J. Towle
	William P. Denning
Harold L. Clancy	Joseph G. Macek
William J. Montgomery	Sidney R. Glover
Ralph W. Spencer	Erwin A. Schmidt
Zeb Stapleford	Guy W. Trent
Russell W. Dillon	Carl Swenson
Martin K. Boger	Thomas V. Wyllsey
Vollie O. Burkett	Joseph E. Stockwell
Joseph C. McCullough	John Belechak
Claud F. Tilley	Benno W. Hild
Robert P. Gott	Tommy Ray
Robert R. Bass	Ray L. Trimble
Joe C. Collier	Steve Taylor
John J. Kowaleski	

---oOo---

TORNADO SENDS THINGS FLYING AT FRANCE FIELD

During a normal rainstorm on December 6th, France Field, Panama Canal Zone, experienced its first tornado. First came the rain in veritable sheets. Next came the winds in terrific battering blows, accompanied by huge sections of galvanized steel roofs of hangars and huts. Trees were uprooted, and sentry boxes, one with a sentry seeking refuge from the storm, were hurled twenty yards from foundations.

One A-17 airplane broke loose from its stakes and went rolling rapidly down the field. Pursuing the plane in his car, Lieut. Jack Carter was able to jump in and stop it, thus saving one airplane for the Air Corps.

Three men in the radio hut adjoining the Base Flight Hangar narrowly escaped death when sections of the roof of the hangar crashed completely through the hut, demolishing it.

Two women clerks in the Quartermaster Office became hysterical when the roof of that building was lifted off by the winds. They ran outside in the torrential rains and flung themselves in a drainage ditch for protection.

Fortunately, the tornado lasted scarcely half a minute, or there would have been much more damage. No airplanes were seriously damaged, but it was estimated that about $50,000 will be required to repair and replace ruined hangars and equipment.

---oOo---

GLENDALE SCHOOL GRADUATES 71 PERCENT OF ORIGINAL CLASS.

Twenty-four Flying Cadets out of an original class of thirty-four survived the primary training course in the class graduating from the Grand Central Flying School at Glendale, Calif., on December 16th. The graduates were sent to Randolph Field, Texas, for the three months' course of basic flying training.

BLERIOT AIRPLANE FOR WRIGHT FIELD MUSEUM

The Army Aeronautical Museum at Wright Field received an interesting new exhibit, a Bleriot airplane of the same type in which the famous first crossing of the English Channel was made. The airplane was donated to the Air Corps by Ernest Hall, who has spent some time at the Materiel Division on temporary duty in charge of its assembly.

Louis Bleriot, it will be remembered, designed the first airplane of monoplane structure; likewise, he was the first designer to put the engine in the nose of the plane with a tractor propeller in front of it. He also conceived a fish-like or streamlined body with the horizontal and vertical control surfaces located at the rear end of the fuselage, and introduced the stick form of control. The wings were warped after the old Wright method. It proved to be a new standard, copied by other designers for many years thereafter. After building this radical structure, he made the first air crossing of the English Channel back in the dim days of 1909 - a time already as traditional for aviation as centuries have proved for other arts and sciences.

The model donated to the Museum resembles this early Bleriot model in all details. Parts of it were acquired by Ernest Hall in 1910, a year after the channel crossing, and the airplane is known as the "Channel" model. With its "stick and wire" construction, its breezy cockpit, its bell control, its model of the 3-cylinder Anzani air-cooled engine, which develops 28 horsepower, it is an exhibit to set present-day early birds to reminiscing and modern designers to wondering. It is mounted under the ceiling beams of the Army Aeronautical Museum, just opposite an exact reproduction of one of the early Wright gliders. For this gift of lasting value, the Air Corps owes its thanks to the donor.

The name of "Wright Escadrille" has been taken by a new civilian flying club in Dayton, for which J.P. Callahan of the Equipment Branch, Wright Field, has been chosen instructor. Mr. Callahan is a reserve officer.

---oOo---

Following the December 5th examinations, 25 members of the 53rd School Squadron, stationed at Randolph Field, Texas, successfully passed the tests and were placed on the eligible list for appointment as Air Mechanics.

Many members of the 53rd are proudly displaying new chevrons at this time, from the "one striper" to the coveted "Master."

CHIEF OF AIR CORPS INSPECTS GRAND CENTRAL FLYING SCHOOL

Major General Henry H. Arnold, Chief of the Air Corps, upon arriving at the Air Corps Training Detachment at Glendale, Calif., found his old friend Bill Henry, war correspondent of the Los Angeles Times and Columbia Broadcasting System, waiting to greet him.

Henry, just back the previous day from the Western Front, sat beside General Arnold at a luncheon given by Major C.C. Moseley, owner of Grand Central Flying School and Curtiss-Wright Technical Institute, where Flying Cadets and enlisted men of the detachment are being trained, and gave the Air Corps Chief and his staff two hours of first-hand information about the War. Since the war began, Henry has been at the front with Royal Air Force groups.

Upwards of twenty Los Angeles newspaper men met General Arnold as he arrived to begin his inspection, the large group attesting the current public interest in the Air Corps' training program. Since the training Detachment was established last July, the publicity department of Grand Central and Curtiss-Wright Tech. has devoted almost its full time to creating public interest and backing for the Air Corps operation.

---oOo---

ONE ON CAPTAIN BROWNE

On a recent trip to Tegucigalpa, Honduras, Capt. Roger Browne, commanding the 24th Pursuit Squadron of Albrook Field, C.Z., picked up the name of "Navigator" and it looks like the name is going to stick to him.

After leaving Managua, Nicaragua, members of the flight, led by Capt. Browne, were supposed to go to an emergency landing field, known as San Lorenzo, and change course there for Tegucigalpa.

The route, it was known, was between two ranges of hills.

With San Lorenzo in sight, Capt. Browne changed course. As the E.T.A. arrived, all members, including himself, were surprised to learn that their destination was nowhere in sight.

Then came the light, and all nine members of the flight discovered they had gone up the wrong valley, and it was necessary to cross another range of hills to get to the Honduras city.

"I just went up the wrong gulley", Capt. Browne explained.

No member of the flight had known the difference to begin with. All admitted that they had checked off check points as they came to them, even if they were on the wrong course.

---oOo---

SECOND CLASS GRADUATES FROM ABBREVIATED COURSE AT AIR CORPS TACTICAL SCHOOL.

The second class to undergo the abbreviated course of instruction (three months) at the Air Corps Tactical School, Maxwell Field, Ala., graduated on December 5, 1939. Ninety-six Air Corps officers and four officers from other branches of the service completed the course.

The student officers staged a graduation party on the night of December 2nd, which featured several skits and afforded those who participated therein to lampoon their instructors.

Major General Henry H. Arnold, Chief of the Air Corps, was the principal speaker at the graduation exercises. Following the invocation by Chaplain McWilliams, a recent arrival at Maxwell Field, Colonel Millard F. Harmon, Assistant Commandant of the Tactical School, delivered a brief address of appreciation to the members of the class and all those who extended their aid towards the success of the School.

Colonel Walter R. Weaver, Commandant of the Tactical School, then introduced General Arnold who, during the course of his address, described and reviewed the current system of tactical education in the Air Corps. He stated that it was most probable that five more 3-months' classes of 100 students each would be held at the School, and that this would mark the tactical schooling of practically all those Air Corps officers who were over 32 years of age. He then proceeded to describe some of the problems which will confront the students when they will have returned from the school to their home units, chief among them being the care and consideration of the thousands of young recruits the Air Corps is now receiving from civil life- a body of men referred to by him as an outstandingly fine type of young American manhood.

At the conclusion of General Arnold's address, diplomas were presented to the graduates, two of whom received outstanding ovations from their classmates - Major N. Stewart, dubbed "General A" by his classmates for his unusual active interest in matters presented by his instructors, and Major Lewis S. Webster, General A's Chief of Staff. At the class party, several days prior to the graduation exercises, both of these officers were called on the mat by the Master of Ceremonies of the students' party, Captain Eareckson, and presented with appropriate tokens of appreciation for their extra curricula activities ******.

During his stay at Maxwell Field in connection with the graduation exercises at the Tactical School, General Arnold had occasion several times to give talks to the assembled officers of the Post. In one of these talks he described the application of the principles of air power in a modern military campaign. Again, informally, he voiced his appreciation of the Air Corps personnel. Referring to the current expansion, he stated he was well pleased with the progress being made and with the increase in tempo of activities at the Air Corps Tactical School.

---oOo---

NEW PHOTOGRAPHIC AIRPLANE

The first photographic airplane, of an order placed with the Beech Aircraft Corporation, has been delivered at Wright Field, Ohio. Assigned the designation F-2, it is the only airplane especially designed to carry two tactical mapping cameras in tandem. The construction is an all-metal, three-place, two-engine, low-wing monoplane especially built for use in rapid and accurate mapping of large areas. The design is such that the maximum possible visibility is afforded the pilot and photographer, and take-off and landing can be accomplished on the relatively small airdromes which frequently must be used in mapping the mountainous sections of the United States.

Two Pratt and Whitney 9-cylinder engines furnish power. Propellers are two-bladed, with a diameter of 8 feet, 3 inches. The wing span is 47 feet, 7¾ inches.

Besides the tactical mapping cameras mounted in tandem, arrangements are made to include a single rapid reconnaissance mapping camera, an additional tactical mapping camera, mosaic and spotting high altitude camera, an oblique spotting camera, and a night spotting camera.

The airplane, which is similar to the commercial type developed by the Beech Aircraft Corporation, is equipped with a radio and automatic pilot.

---oOo---

TWO RANDOLPH FIELD NONCOMS RETIRED

Master Sergeant Fred B. Rowell, 53rd School Squadron, and 1st Sergeant Albert Schleich, 52nd School Squadron, Randolph Field, having reached the end of their 30 years' period of service, were placed on the retired list, effective December 31, 1939.

Sergeant Rowell has been a member of the Air Corps since December 2, 1914. Sergeant Schleich first joined the Air Corps on August 29, 1928, being assigned to the 52nd Squadron, from which organization he retires as "Top."

Sergeants Rowell and Schleich were congratulated by Colonel John B. Brooks, Commanding Officer of Randolph Field, on their excellent records, and extended his good wishes in their well-earned retirement.

---oOo---

"A L A E S U P R A C A N A L E M"

By Brigadier General Herbert A. Dargue, Air Corps

Part III

For years the steamship travel bureaus have publicized the lands which border the Caribbean Sea, and the islands within it, as tropical playgrounds, stressing the fact that here is to be found delightful recreation and holidays tinged with romance. But little has been written of the work that is being accomplished in Central America, of everyday life here, and of normal activities. The "tropical paradise" theme has been over-stressed all too frequently. Conversely, a great many people have the idea that the country consists of dank, steaming jungle entirely, and that life and health is something to be jealously guarded.

The personnel of the 19th Wing, stationed at Albrook and France Fields in the Canal Zone, and engaged as they are in an occupation which demands physical fitness and mental alertness, have found that here there are a great many widely varied opportunities for relaxation and recreation. During hours of freedom they have as wide a choice of pastimes as any of their fellows in the United States or elsewhere, if not more. A mild, even climate, and splendid facilities for recreation, plus the natural potentialities of the country for sport, all make for a healthy, active life.

Fishing and hunting and kindred outdoor sports have long been favorites with Air Corps personnel. Golf and tennis have their ardent devotees. Swimming, riding, boating, shooting - and nearly every other sport, outdoor or indoor, may be practiced here the year round.

Authorities on salt water fishing agree that for quantities of great sporting fish, the Bay of Panama is hard, indeed, to equal. Here are to be found giant black marlin, the Pacific sailfish, varieties of jacks and bonitos, Sierra mackerel, yellow-fin tuna, the sporty "rooster fish," snappers, dolphin and dozens of other varieties. Kip Farrington, a noted salt water angler, states that there is as much fish life about the Perlas Islands in Panama Bay as in any place he has ever visited. Anything from a light brass rod to the heaviest of salt water tackle will pay the richest of dividends in pleasure and enjoyment. Fishing here is a popular sport, indeed. If you have been assigned to the Canal Zone, by all means bring along all the tackle you can get together - the possibilities are endless. At France Field, within a hundred yards of the runways, have been caught tarpon of huge size. At the spillway at Gatun Dam, casting for small tarpon and robaldo is fine sport, and they strike hungrily and often. In the Chiriqui Mountains at Boquete, near the northern border of Panama, and quite accessible is a mountain stream containing an abundance of trout.

Hunting in Panama is a sport for the enthusiast only. There is game here, and in plenty, but the fact that most of the game animals are night prowlers and not frequently found by day, presents an obstacle. Deer are often seen at night - seldom seen by the daylight hunter, but they may be found if one has the persistence and necessary skill.

To the westward of Albrook Field, in the foothills of the mountains, where the country is very much like western Texas, there is an abundance of game. The hunter must be diligent, however, and guides and dogs are useful, if not essential. Also to be found are the native game birds, the giant wild pigeon, native turkey, pheasant, doves, a few quail, and in the northern zones ducks in great numbers. In the mountains and in the deep forest are the giant tapir, or "vaca del monte," the jungle cats - ocelot and whistlers. Everywhere are the native rabbits and the "conejo," a large brown rabbit-like creature. A good shotgun and a .22 rifle will provide excellent sport. There are no bag limits or closed seasons in the Republic of Panama - a hunting license is all that is required; and, but few sections of the Canal Zone are closed to hunters, while the remainder is open.

There are a number of splendid golf courses available to Air Corps personnel, the two best being the Panama Golf Club course just outside Panama City on the Pacific side, and the Gatun course on the Atlantic side. Fees are reasonable, and the game is very popular on both Air Corps posts here. Both stations are equipped with tennis courts and squash courts, both have pistol and rifle ranges, both have skeet ranges. There is a new concrete swimming pool at Albrook Field, and a beautiful salt water pool is adjacent to France Field, on the Naval Reservation of Coco Solo.

Horses from the stables of the neighboring posts are available to the officers here, and jungle trails lead in all directions. At France Field there is a splendid anchorage for boats, and a great number of personally owned craft are kept here. Near Albrook Field, the Balboa Yacht Club makes provision for the docking and repair of pleasure craft. In addition, each post maintains at least one boat for recreational uses by members of the command.

There are theaters at each of the Army posts on the Isthmus, and late pro-

ductions are shown, with a complete change of program every evening. Parties and social functions are frequent and highly successful. There are beautiful, open air dancing pavilions in both Colon and Panama City, gay clubs and cabarets.

Panama is rich in legend and historical background, and sightseeing and trips to the interior and to the landmarks of Old Panama are always of interest.

There is practically no limit to the possibilities for pleasure and amusement. Individual tastes and the limits of one's free time are the only confining factors. We of the 19th Wing have had to give up none of our sports or amusements while serving in the Canal Zone. Since healthful recreation, exercise, and mental relaxation are vitally important in the business of keeping fit, we find time, all of us, to enjoy thoroughly the opportunities which the place affords.

Note: Considerable credit is given 2nd Lieut. Joseph H. Paul, Air Reserve, in the preparation of this article.

---oOo---

TRAINING ACTIVITIES IN PANAMA
By the News Letter Correspondent

The present international situation makes the Panama Canal Uncle Sam's key position insofar as national defense is concerned. Even though our position is one of strict neutrality, the strategic importance of the Canal is so great that its defense units must be ready for instant action against any aggressor.

It is a known fact that one very logical form of attack would come from the air and would be directed at vital spots of the Canal so as to cripple its operation.

The 6th Bombardment Group, located at France Field on the Atlantic side of the Isthmus, has been conducting a series of Group problems in preparation for any emergency that might arise.

Through the Cristobal Port Captain, the Group Commander arranges to obtain information as to the approximate position and description of some ship approaching or leaving the Canal. Then, the following morning, the 7th Reconnaissance Squadron is charged with conducting a search mission for the ship in question. Conditions of actual warfare are simulated so far as practicable. Radio silence is maintained with the exception of periodic position reports which are communicated for purposes of safety; however, under actual conditions even these would be omitted as they give information to the enemy.

The individual planes are fanned out in a search formation, the interval between planes depending directly upon the visibility. When the target (ship in question) is sighted, an encoded contact message is radioed to the Group Commander, giving the time of interception, course, estimated speed, and position. With this information in hand, the Group Commander issues an order to the Commanding Officer of the 25th Bombardment Squadron, who takes off with all ships of his squadron fully equipped with bombs, ammunition, etc. The Bombardment Squadron then flies to the position reported and releases sufficient oil to create a "Slick" on the ocean's surface, which serves as their target for the problem.

The Group has been selecting ships ranging between 150 and 200 miles off shore, but this distance will be gradually increased as the personnel gather experience.

The big point that has been demonstrated to all the personnel taking part in these problems is that practice is essential to success. The team work required is of the same order as that displayed in a smooth working football or baseball team, and only one weak point will result in failure. Each successive trip finds fewer flaws in the operation of the problem, and this in turn builds confidence and morale - two important essentials in air discipline.

It is the opinion of the Group staff that, should its aid be called on, it will be qualified in every sense to perform its mission.

---oOo---

CHANUTE FIELD'S PUBLIC RELATIONS ACTIVITIES.

Since the advent of the Air Corps Expansion Program, authorized by the 76th Congress, the duties of the Public Relations Office at Chanute Field - home of the Air Corps Technical School - Rantoul, Ill., have increased many fold. The success of any large scale recruiting drive can be directly attributed to the widespread use of newspaper publicity. Employing such organs as OUR ARMY Magazine and RECRUITING NEWS, along with regular contributions to various newspapers throughout Central Illinois, the Chanute Field Public Relations department has been able to sell the idea of a technical education to young men by pointing out the many advantages offered by the Air Corps Technical School. This work is greatly aided by the many fine cuts produced by the Photographic Department which illustrated the 1176 column inches of publicity printed during the months of October and November, 1939. Also, under the guidance of Major James E. Duke, Jr., Public Relations Officer, is the series of radio programs, WINGS OF THE ARMY, heard weekly over Station WDWS in Champaign-Urbana, Ill.

V-8323, A.C.

The Photographic Department at Chanute Field recently received four new Speed-Graphic cameras. These cameras are of a type in wide use throughout the world by prominent news services. The syncro-flash devices, part of the regular equipment, make them invaluable for the type of pictures that are needed to supplement Public Relations news releases. No longer does the cameraman have to depend upon weather and lighting conditions before taking pictures. The new cameras will take a sharp and well-defined picture at any time or place.

There are two distinct types of news items being released through the Chanute Field Public Relations Office - general news releases concerning Chanute Field, and special news items of Air Corps Technical School activities - Chanute Field Branch.

A total of 996 column inches appeared in newspapers throughout Central Illinois, with 622 inches being devoted to general news items concerning Chanute Field, covering all phases of activities not related to the Air Corps Technical School, viz: construction, visits of notable persons and other topics of a similar nature. A total of 209 inches was devoted to the Air Corps Technical School and, lastly, 165 inches generally plugging the Army Air Corps, high-lighting no particular field. Figures quoted on publicity are taken from articles on file in the Public Relations Office. The actual publicity in inches is unknown, as a large number of the articles are released and editors fail to forward clippings.

The greatest difficulty thus far encountered has been the fact that many of the smaller and weekly newspapers do not have the facilities for cutting mats. They were interested in publicity concerning the Air Corps, but express regret over their inability to make use of the pictures. A careful study has proven that towns and cities with a populace between 10,000 and 100,000 are most likely to print A.C.T.S. items. Of course, there are always exceptions to any rule. School publicity has consisted mostly of an individual shot of a student at work in a classroom activity of his particular course. Captions were provided, in text about as follows:

> Private Walter F. Domanski, son of Mrs. Helen A. Domanski, of 75 Clark Street, New Britain, Conn., is shown operating a radio compass, one of the many phases of instruction covered in the Radio Repairers and Operators Course at the Air Corps Technical School, Chanute Field, Rantoul, Ill. He is one of the 3,000 students to graduate from the Department of Communications during the Air Corps Expansion Program. The Department of Mechanics, also at Chanute Field, will turn out 7,000 graduates during the next two years.

One specific instance of a picture page layout secured in the Ottumwa Courier, Ottumwa, Iowa, might be further explained as having the following set-up: Seven individual pictures of men from Ottumwa, an aerial view of temporary barracks, interior shot of one of the new barracks, and one class room shot of a group of students at work. A notation was made on one of the captions that information relative to enlistment could be obtained from the Public Relations Officer. Twelve young men responded, and several subsequently enlisted for service at Chanute as a direct result of the feature story carried in the Ottumwa Courier. Contacts are being made with editors for more of this type of publicity.

The WINGS OF THE ARMY radio programs have undoubtedly done much to create interest in Chanute Field and the Army Air Corps. They have very effectively pointed out the advantages of securing a technical education in aviation through the medium of the Army Air Corps. In spite of the technical variety of topics covered, they were presented in such a manner as to be clearly understood by even juvenile listeners. This program is nearing completion, and efforts are being made to continue broadcasting from the Field to keep the Air Corps Technical School constantly before the public.

---oOo---

NEW POST OFFICE FOR ALBROOK FIELD

Albrook Field, Canal Zone, is one of the two places in the Panama Canal Zone to receive a new post office, and it was opened December 1st in the Albrook Field Headquarters building.

Postal officials announced that the installation of the new office was to care for the increased business at the field due to the arrival of additional officers and men.

Mr. Harold O. Ludwig, formerly postmaster at Corozal, took charge of the new office. Record business was anticipated the first few days the office was opened, for the Bureau of Posts had received many inquiries from philatelists who wishes to obtain first day cancellations.

---oOo---

A total of 39 students graduated as Radio Repairers and Operators from the Air Corps Technical School, Chanute Field, Ill., on December 15, 1939. Chanute Field had the largest representation of graduates, with 17, followed by Bolling Field with 4, Selfridge and March Fields with 3 each and Langley Patterson Fields with 2 each. Eight other stations had one student each.

HIGH PERCENTAGE OF PRIMARY FLYING STAGE GRADUATES

Under Special Orders of the War Department, recently issued, 109 second lieutenants of the Regular Army, graduates of the June, 1939, Class of the U.S. Military Academy, West Point, N.Y., were assigned to duty at Randolph Field, Texas, to undergo the basic course of flying training. Originally, a total of 147 West Point graduates had been assigned to the nine civilian elementary flying schools to undergo the three months' primary flying course. The number of graduates from this course, approximating 74%, is above the usual average, for - past experience has indicated that the number of students completing that stage of flying instruction normally approximates 60%.

The graduates from the nine elementary flying schools are listed below, as follows:

Spartan School of Aeronautics

Willard B. Atwell, Inf.	John L. McCoy, Inf.
Donald R. Ross, CAC	Cecil C.McFarland,Inf.
John W.Carpenter,3d,FA	Joseph G. Perry, C.E.
John A. Chechila, SC	R.C.Richardson 3d,Cav.
Albert L. Evans,Jr. CAC	Robert J. Rogers,Inf.
Fred'k H.Foerster,Jr.CAC	Daniel F. Tatum, Inf.
Geo. E. Howard,Jr. SC	Robt. C. Twyman, SC
William C. Jones, Cav.	Leon R. Vance,Jr.,Inf.
Andrew J. Kinney, CAC	Alfred V.Walton, Inf.
Salvatore E. Manzo, Inf.	Robt.C. Whipple,Inf.
Tom K. Martin, Inf.	

Allan Hancock College of Aeronautics

James E. Mather, Cav.	Oliver B. Taylor,Inf.

Parks Air College

John C. Edwards, Inf.	Ray J. Will, Inf.
Carl W. Hollstein,Inf.	Elbert O. Meals, CAC
Joseph E. Reynolds,Inf.	Robert B. Miller, CAC
Eugene A. Romig, Inf.	S.B. Hardwick,Jr., FA
Elliott Vandervanter, Jr., Inf.	

Grand Central Flying School

Walter J. Alsop, Inf.	Joseph H. Frost, FA
Robert E. Greer, CAC	

Alabama Institute of Aeronautics

Burnham L. Batson, Inf.	John E.L. Huse, Inf.
Vincent L. Boylan, Cav.	Harmon Lampley, Jr., FA
R.C. Crawford, Jr., CE	R. Van W.Negley,Jr.
Warner W.Croxton,Jr.,FA	Roger E.Phelan, FA
Joseph L. Dickman, Inf.	Chas. M. Walton,Jr.Inf.
Allen F. Herzberg, SC	A.T. Williams III, Cav.
Chas. H. Hillhouse, FA	P.T. Wynne, Jr., CAC

Lincoln Airplane and Flying School

A.K. Breckinridge,Cav.	Maurice M.Miller,Inf.
James D.Garcia, CAC	Wm. W. Nichols, Cav.
Robert D.Hunter,Cav.	Leonard N.Palmer, SC
Newton E. James, Inf.	Robert M. Wray, SC

Chicago School of Aeronautics

Robert F.Cassidy,FA	Paul R.Okerbloom, SC
Elwood P.Donohue, FA	John G. Pickard, CAC
Robert P. Hoffa, SC	Delmar J. Rogers, CE
F.W. Iseman, Jr. FA	John S. Samuel, CE
E.J. Lateszewski, FA	Wm. T. Smith, CAC
Robert R. Little, FA	Lewis W. Stocking,Inf.
Chas. J. Long, 3d, CAC	Thos. B.Whitehouse,Cav.
Norman J. McGowan, CAC	James W. Wilson, Inf.
Richard S.Morrison, SC	Geo.W.R.Zethren,FA

Ryan School of Aeronautics

Chas. H. Bowman,Inf.	Richard G. Lycan, FA
Elmore G. Brown,Inf.	James L.McBride,Jr.CAC
S.W.FitzGerald,Jr.,FA	David K.White, CAC
George Y. Jumper, Cav.	

Dallas Aviation School and Air College

Milton B.Adams,Inf.	James B. Knapp, SC
Benj. F. Avery,3d,Inf.	James L. LaPrade,Inf.
William S. Boyd, Inf.	Paul J. Long, Inf.
Harry N. Brandon, CE	E.B. Maxwell, FA
T.J.J.Christian,Jr.FA	Wm. L. McDowell,Jr.Cav.
M.W. Engstrom, Inf.	M.J. McKeever, Jr.Inf.
Walter W. Farmer, CE	Jack G. Merrell, Cav.
William A. Garnett,Cav.	R.T. Petersen, Inf.
Benoid E. Glawe, FA	Robert C. Sears, Inf.
Hugh A. Griffith,Jr. SC	C.L.Shepard Jr., FA
Laird W.Hendricks,CAC	H.R. Sullivan,Jr. FA
Perry M.Hoisington,2d,Inf.	L.N.Taylor,Jr., FA
Ellsworth R.Jacoby,Inf.	Tilden P. Wright, CAC
Jos.T.Kingsley,Jr.,CAC	

---oOo---

THE NUMBERING OF RUNWAYS

Lieut. Colonel Edgar P. Sorensen, Air Corps, of the Office of the Air Corps Board, Maxwell Field, Ala., recently forwarded the following communication to the Information Division:

"1. A good question is put by the last sentence of your article entitled 'A Warning to Pilots,' page 16, News Letter of November 15th, 1939. When a visiting pilot is told over the airport control radio to land on runway number six it is frequently necessary to do a bit of searching for the said number six.

2. It appears that good use could be made of the numbering as it appears on the face of a clock for a solution of this problem. A plan substantially as follows would be appropriate:

Select approximate center of the landing area for orientation purposes.

Orient clock numbering about that center and with 12 always at the north.

Select and use such numbers from the face of the clock as most nearly fit the positions of ends of runways, landing strips, or usable edges of the landing area.

3. On a field known to be marked as suggested above, a visiting pilot, when told to land at six, knows he will find six appropriately centered at the south edge of the field. Airport control could then simply tell the visiting pilot to 'land on runway at six,' or 'land at six toward the north,' etc., thus simplifying conversation somewhat as well as making it easier for the pilot to determine the indicated spot on a strange field."

---oOo---

During November, 1939, the Engineering Department of the San Antonio Air Depot overhauled 16 airplanes and 123 engines, and repaired 34 planes and 8 engines.